

204 THE BASIC OPEN-HEARTH STEEL PROCESS

The available heat of the products is as follows :—

Cals.

99 kilogrammes of steel X 350 ~- IM,(>f)0

5*9 kilogrammes slag X 32 5 ~: 3,097

0(a from 7*22 kilogramme limestone T'li'^X ISO . l,JJl)()

Total heat in products ":ji),(M7

The heat demand of the reactions is :

(Separation of P from "Fo not taken into account) . n. t.

1 Jecio position of limestone 7'22x*1 2") . : • .' {,0<5S

Total heat requirement -12,115

Against this heat liberated by reactions : From 1 kilogramme P yielding "1W, f>,905 eals.

2*29 kilogrammes 1V\ <>n combination with OaO, 2-29x1,131 (from 57) "

2,590 " 8,555

Thus furnace muni, supply ;W,f>(>0

Or per kilogramme steel -•' ""^ J . 'i.'W cals.

One per cent. P in the charge thus diminishes the heat demand for the production of 1 kilogramme steel by }jr>0 — 3H9 = 11 calories . . . (GO).

4. Influence of j

From a charge of 99 kilogrammes iron and 1 kilogramme Mn IB produced (ride pp. 1H(> and 1H7) 99 kilo^rammas stool. For the foregoing calculation, slag does not come into account. In reality SiOa and carbon aro ahvayn proHtiit, and the manganese protoxide produced from the manganese in received by the slag, which is stipulated for by the substance, named.

The heat content of the products is :

dais,

99 kilogrammes steel X «'M() = . 'M, (>/>())

The heat of union of Mn with Fo is unknown.

Thus the heat (loniand in IM, <>/>())

Of which the combination of 1 kilo^ranono Mn

liberates 1,724

Thus furnace inunt furni.sh Uij/J^J Or per kilogramme stool L~* *..».. *—•;\$;\$;\$ calH.

One per cent. Mn in the charge thus diminishes the heat demand for the production of 1 kilogramme stool by j\$r>0— 38D = 17 calories . . . ((51).